

WHAT IS CLAIMED IS:

1. An exposure method of exposing a predetermined pattern formed on a reticle to a substrate through a projection optical system while
5 the reticle and the substrate are scanned in synchronous with each other, comprising:

a measuring step of measuring a position of an image plane of the projection optical system at a plurality of different measurement positions with
10 respect to a direction in which the reticle and the substrate are scanned; and

a correcting step of correcting a tilt of the image plane of the projection optical system based on measurements obtained by the measuring step.

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2. An exposure method according to claim 1, wherein the plurality of measurement positions in the measuring step are at least three positions which are not arranged on a straight line.

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3. An exposure method according to claim 1, wherein the correcting step includes correction of a tilt of the image plane of the projection optical system in the scanning direction in accordance with
25 the measurements obtained by the measuring step.

4. An exposure method according to claim 1,

further comprising:

a step of calculating a curvature of the image plane of the projection optical system from the measurements obtained by the measuring step.

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5. An exposure method according to claim 1, wherein the correcting step includes adjustment of at least one of a position of the substrate and the projection optical system to reduce the tilt of the image plane of the projection optical system, which is caused from the predetermined pattern.

6. An exposure method according to claim 1, wherein the correcting step includes at least one of drive of an optical element included in the projection optical system in an optical axis direction of the projection optical system and decentering of the optical element about the optical axis direction of the projection optical system, and tilting of the optical element with respect to the optical axis direction of the projection optical system.

7. An exposure method according to claim 1, wherein at least one of the plurality of measurement positions are located outside an area which is irradiated with exposure light at a time of exposure.

8. An exposure method according to claim 7,
wherein at least one of the plurality of measurement
positions is located outside an area which is
irradiated with the exposure light in the scanning
5 direction.

9. An exposure method of exposing a
predetermined pattern formed on a reticle to a
substrate through a projection optical system while
10 the reticle and the substrate are scanned in
synchronous with each other, comprising:

a measuring step of measuring a position of an
image plane of the projection optical system at a
plurality of different measurement positions
15 including a measurement position located outside an
area which is irradiated with exposure light at a
time of exposure; and

a correcting step of correcting a tilt of the
image plane of the projection optical system based on
20 measurements obtained by the measuring step.

10. An exposure method according to claim 9,
wherein at least one of the plurality of measurement
positions is located outside the area which is
25 irradiated with the exposure light in the scanning
direction.

11. An exposure apparatus for exposing a predetermined pattern formed on a reticle to a substrate through a projection optical system while the reticle and the substrate are scanned in
5 synchronous with each other, comprising:

a measuring mechanism for measuring a position of an image plane of the projection optical system at a plurality of measurement positions different from each other with respect to a direction in which the
10 reticle and the substrate are scanned; and

a correcting mechanism for correcting a tilt of the image plane of the projection optical system based on measurements obtained by the measuring mechanism.

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12. A device manufacturing method, comprising:
a step of applying a photosensitive agent to a substrate;

an exposing step of exposing the substrate by
20 the exposure method according to claim 1; and

a developing step of developing the exposed substrate.

13. A device manufacturing method, comprising:
25 a step of applying a photosensitive agent to a substrate;

an exposing step of exposing the substrate by

the exposure method according to claim 9; and
a developing step of developing the exposed
substrate to be processed.

- 5 14. A device manufacturing method, comprising:
a step of applying a photosensitive agent to a
substrate;
an exposing step of exposing the substrate by
the exposure apparatus according to claim 11; and
10 a developing step of developing the exposed
substrate.